Air Quality Permit

Issued To: Bear Paw Energy, Inc.
Baker Gas Plant
P.O. Box 580
Baker, MT 59313

Permit #2736-07
Modification Request Received: 07/14/02
Department Decision on Modification: 08/02/02
Permit Final: 08/20/02
AFS #025-0001

An air quality permit, with conditions, is hereby granted to Bear Paw Energy, Inc. (Bear Paw) pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA) and the Administrative Rules of Montana (ARM) 17.8.701 *et seq*., as amended, for the following:

Section I: Permitted Facilities

A. Location

Bear Paw operates a natural gas processing plant and associated equipment located in the SW ¼ of the SW ¼ of Section 6, Township 7 North, Range 60 East, in Fallon County, Montana. This facility is known as the Baker Gas Plant. A complete listing of the facility's permitted equipment can be found in Section I.A. of the Permit Analysis.

B. Current Permit Action

On May 21, 2002, the Department of Environmental Quality (Department) received a letter from Bear Paw notifying the Department of a de minimis change at the Bear Paw facility. The de minimis change consists of switching the responsibilities of the two flares at the facility. The Department requested that Bear Paw submit a gas analysis for the facility because the calculations submitted for Department review used an H_2S concentration lower than the concentration in the emission inventory of Permit #2736-06. On July 14, 2002, Bear Paw submitted a gas analysis for the facility demonstrating that the concentration of H_2S in the gas stream is 600 parts per million (ppm). The current permit action does not increase emissions from the facility. In fact, the gas analysis submitted to the Department demonstrates that SO_2 emissions from the facility will decrease.

In addition, Bear Paw requested a condition be added to the permit regulating the amount of natural gas (supplemental fuel) to be added to the acid gas stream prior to flaring (950 cubic feet per hour (ft^3/hr) at maximum capacity). The condition will ensure that the impacts from the emissions from the shorter challenger flare will not violate either the National Ambient Air Quality Standards (NAAQS) or the Montana Ambient Air Quality Standards (MAAQS).

The current permit action switches the responsibilities of the two flares according to the provisions of ARM 17.8.705(1)(r). The guyed utility acid gas flare will now be used to destroy the gas stream created from process upsets (including emergency relief valves) and the challenger flare will now be used to destroy the acid gas stream from the amine regenerator. In addition, the current permit action modifies the permit according to the provisions of ARM 17.8.705(2) to add a condition requiring 20% of the total gas routed to the flare is natural gas.

Section II: Limitations and Conditions

A. Emission Limitations:

1. Bear Paw is permitted to operate a 1250-horsepower (hp) engine or a series of engines with a rated capacity equal to or less than 1250-hp (excluding the engines identified in Sections II.A.3. and II.A.4). Each engine shall be controlled by a catalytic converter (ARM 17.8.710 and ARM 17.8.715).

2. The combined emissions from all engine(s) comprising the 1250-hp, shall not exceed the following limits (ARM 17.8.715):

NO_x[1]	5.51 lb/hr
CO	5.51 lb/hr
VOC	2.76 lb/hr

3. The 448-hp Waukesha compressor engine shall be operated with an air-to-fuel ratio (AFR) controller and a non-selective catalytic reduction (NSCR) unit. The engine speed shall not exceed 1000 revolutions per minute (rpm) of continuous duty operation. Emissions from the 448-hp Waukesha compressor engine shall not exceed the following limits (ARM 17.8.715):

NO_x[1]	1.98 lb/hr
CO	2.96 lb/hr
VOC	1.00 lb/hr

4. The 800-hp White Superior compressor engine shall be operated with an AFR controller and an NSCR unit. The engine speed shall not exceed 900 rpm of continuous duty operation. Emissions from the 800-hp White Superior compressor engine shall not exceed the following limits (ARM 17.8.715):

NO_x[1]	3.53 lb/hr
CO	5.29 lb/hr
VOC	1.76 lb/hr

5. Bear Paw shall route the dehydrator regenerator off gases to the Anderson Hot Oil heater for thermal destruction at all times, except when the heater is not operating. The flash separator off gases shall be routed to the inlet condensate knockout drum (ARM 17.8.715).

6. The VOC product loading and receiving at the Baker Plant shall be operated under a vapor balance system. All VOC product loading to tank trucks shall be conducted using bottom loading. Vapor flash resulting from loadout operations shall be returned to the associated storage vessel to maintain vapor balanced emissions control. Upon completion of VOC product loadout, all lines used for loading shall be purged of VOC vapors. These VOC vapors shall be routed to a flare for thermal destruction (ARM 17.8.715 and ARM 17.8.324).

7. Bear Paw shall use fixed roof tanks for storage of natural gasolines and pressurized tanks for storage of re-run, propane, and butane. The fixed roof tanks shall be vapor balanced, submerge filled and equipped with a pressure/vacuum vent. The pressurized tanks shall be vapor balanced, submerge

[1] NO_x reported as NO_2.

filled, and equipped with a pressure/vacuum vent (ARM 17.8.715 and ARM 17.8.324).

8. Bear Paw shall not cause or authorize to be discharged into the atmosphere from either flare:

   a. Any visible emissions that exhibit an opacity of 10% or greater (ARM 17.8.316); and

   b. Any particulate emissions in excess of 0.10 grains per dry standard cubic feet (gr/dscf) corrected to 12% carbon dioxide (CO_2) (ARM 17.8.316).

9. Bear Paw shall be limited to a maximum production rate of 3,102.5 MMScf during any rolling 12-month period (ARM 17.8.710 and 17.8.715).

10. Bear Paw shall route all stack emissions from the amine regenerator to the challenger flare (ARM 17.8.715).

11. Bear Paw shall add natural gas to the acid gas stream prior to flaring. Natural gas shall be added at a ratio of 1 part natural gas for every 5 parts acid gas (20% natural gas) (ARM 17.8.710).

12. Bear Paw shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources or stacks installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

13. Bear Paw shall not cause or authorize emissions to be discharged into the atmosphere from haul roads, access roads, parking lots, or the general plant property without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).

14. Bear Paw shall treat all unpaved portions of the access roads, parking lots, and general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.13. (ARM 17.8.710).

15. Bear Paw shall operate all equipment to provide the maximum air pollution control for which it was designed (ARM 17.8.715).

16. Bear Paw shall install and continuously operate a thermocouple and an associated recorder or any equivalent device to detect the presence of a flame (ARM 17.8.715).

B. Testing Requirements:

1. Bear Paw shall test the 1250-hp Waukesha compressor engine(s) for NO_x and CO, concurrently, and demonstrate compliance with the NO_x and CO emission limits contained in Section II.A.2. Further testing shall continue on an every 2-year basis or according to another testing/monitoring schedule as may be approved by the Department. The 1232-hp Waukesha compressor engine was last tested on January 15, 2002 (ARM 17.8.105 and ARM 17.8.710).

2. Bear Paw shall test the 448-hp Waukesha compressor engine for NO_x and CO, concurrently, and demonstrate compliance with the emission limits contained in Section II.A.3. Further testing shall continue on an every 4-year basis or according to another testing/monitoring schedule as may be approved by the

Department. The 448-hp Waukesha compressor engine was last tested on January 15, 2002 (ARM 17.8.105 and ARM 17.8.710).

3. Bear Paw shall test the 800-hp White Superior compressor engine for NO_x and CO, concurrently, and demonstrate compliance with the NO_x and CO emission limits contained in Section II.A.4. Further testing shall continue on an every 4-year basis or according to another testing/monitoring schedule as may be approved by the Department. The 800-hp White Superior compressor engine was last tested on January 15, 2002 (ARM 17.8.105 and ARM 17.8.710).

4. During each test, Bear Paw shall monitor and record the following: intake manifold temperature and pressure, exhaust manifold temperature and pressure, engine rpm, and all parameters necessary to calculate horsepower. This information shall be submitted to the Department along with the Source Test Report (ARM 17.8.105).

5. An EPA Method 9 opacity test and/or other methods and procedures as specified in 40 CFR Part 60.675 must be performed on the flares at the facility on an every 2-year basis or according to another testing/monitoring schedule as may be approved by the Department, to demonstrate compliance with the emission limitations contained in Section II.A.8. (ARM 17.8.105 and ARM 17.8.710).

6. All compliance source tests shall be conducted in accordance with the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

7. The Department may require further testing (ARM 17.8.105).

C. Inspections and Recordkeeping Requirements:

1. Each calendar month, all valves, flanges, pump seals, and open-ended lines in VOC service shall be inspected for total organic liquid or vapor leaks. For purposes of this paragraph, detection methods incorporating sight, sound, or smell are acceptable (ARM 17.8.715).

2. Bear Paw shall (ARM 17.8.715):

   a. Make a first attempt at repair for any leak not later than 5 calendar days after the leak is detected; and

   b. Repair any leak as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in Section II.C.3. below.

3. Delay of repair of equipment for which a leak has been detected will be allowed if repair is technically infeasible without a process unit shut down. Such equipment shall be repaired before the end of the first process unit shut down after detection of the leak (ARM 17.8.715).

4. A record of each monthly leak inspection, required under Section II.C.1. of this permit, shall be kept on file at the facility. Inspection records shall include, at a minimum, the following information (ARM 17.8.105):

   a. Date of inspection;

   b. Findings (may indicate no leaks discovered or the location, nature, and severity of each leak);

c. Leak determination method;
d. Corrective action (date each leak repaired and reasons for any repair interval in excess of 15 calendar days); and

e. Inspector name and signature.

D. Operational Reporting Requirements:

1. Bear Paw shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified Section I.A. of the permit analysis.

Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information is required for the annual emission inventory and to verify compliance with permit limitations (ARM 17.8.505).

2. Bear Paw shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.705(1)(r) that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location, or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emission unit. The notice must be submitted to the Department in writing 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.705 (1)(r)(iv) (ARM 17.8.708).

3. Bear Paw shall document, by month, the facility throughput in MMScf. By the 25th day of each month, Bear Paw shall total the amount of throughput during the previous 12 months to verify compliance with the limitation in Section II.A.9. A written report of the compliance verification shall be submitted to the Department by the date required in the emission inventory request and may be submitted along with the annual emission inventory (ARM 17.8.710).

4. Bear Paw shall document the amount of acid gas sent to the flare and the amount of natural gas added to the acid gas stream prior to flaring to verify compliance with the limitation in Section II.A.11. A written report of the compliance verification shall be submitted to the Department by the date required in the emission inventory request and may be submitted along with the annual emission inventory (ARM 17.8.710).

5. All records compiled in accordance with this permit must be maintained by Bear Paw as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.710).

Section III: General Conditions

A. Inspection - Bear Paw shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver - The permit and all the terms, conditions, and matters stated herein shall be deemed accepted if Bear Paw fails to appeal as indicated below.

C. Compliance with Statutes and Regulations - Nothing in this permit shall be construed as relieving Bear Paw of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.701 *et seq.*, MCA (ARM 17.8.717).

D. Enforcement - Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement as specified in Section 75-2-401 *et seq.*, MCA.

E. Appeals - Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The Department's decision on the application is not final unless 15 days have elapsed and there is no request for a hearing under this section. The filing of a request for a hearing postpones the effective date of the Department's decision until the conclusion of the hearing and issuance of a final decision by the Board.

F. Permit Inspection - As required by ARM 17.8.716, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by Department personnel at the location of the permitted source.

G. Construction Commencement - Construction must begin within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked.

H. Permit Fees - Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by Bear Paw may be grounds for revocation of the permit, as required, by that section and rules adopted thereunder by Board.

Permit Analysis
Bear Paw Energy, Inc.
Permit #2736-07

I. Introduction/Process Description

A. Permitted Equipment

The Bear Paw Energy, Inc. (Bear Paw) Baker Gas Plant is a natural gas processing plant located in the SW ¼ of the SW ¼ of Section 6, Township 7 North, Range 60 East, in Fallon County, Montana. The facility includes, but is not limited to, the following:

Source #01	1981 Waukesha 448-hp F351G Compressor Engine
Source #02	1981 Superior 800-hp 8G-825 Compressor Engine
Source #03	1981 6.5 MMBtu/hr Anderson Baird Hot Oil Heater
Source #04	1992 35-ft Challenger Flare
Source #05	Fugitive VOC (Components in VOC service)
Source #06	4.0 MMScf/day Ethylene Glycol (EG) Dehydration Unit.
Source #07	Product Loading (Bottom Loading - Vapor Balance)
Source #08	Storage Tanks
Source #09	1997 80-ft Flare Industries Guyed DU-6 Utility Flare
Source #10	1997 2.0 MMBtu/hr Amine Reboiler
Source #11	Waukesha L7042GSI 1,232-hp Compressor Engine

B. Source Description

Natural gas plants remove certain compounds from natural gas that are of considerable value by themselves and other contaminants that render the gas unsuitable for sale purposes. The predominant constituent of natural gas is methane and ethane, with smaller amounts of other hydrocarbons.

The Bear Paw facility has a number of purposes. The first purpose is to boost the field gas to the natural gas transmission system. This initial compression of the gas is accomplished with the 1250-hp Waukesha compressor engine(s), the 448-hp Waukesha compressor engine, and the 800-hp Superior compressor engine.

The compressed natural gas is then dehydrated with the glycol treating system to reduce the moisture content and to meet sales gas specifications for water dew point. The resulting gas stream (sweetened gas stream), which is relatively saturated with water vapor, is passed through a liquid desiccant, ethylene glycol (EG), prior to flowing to the sales line. The glycol dehydration unit is used to remove water from produced natural gas streams to prevent hydrate formation and corrosion in pipelines. EG is used because of its high affinity for water and low cost. The moisture-rich EG leaving the absorption dehydration contact tower is cycled through the regenerator. The heat produced by the glycol reboiler boils off the absorbed moisture in the EG that is vented from the stripper column as water vapor.

EG also has a high affinity for aromatic compounds. In the absorption step of the dehydration process, EG removes, in addition to water, some benzene, toluene, ethyl benzene, and xylenes (BTEX), and VOCs from the natural gas. The absorbed VOCs and BTEX are then separated from the glycol in the regenerator. The dehydrator regenerator off gases are routed to the Anderson Hot Oil heater for thermal destruction, except when the heater is not operating. The flash separator off gases are routed to the inlet condensate knockout drum.

Any H_2S present in the incoming gas stream is removed by the amine sweetening unit. Approximately 8.5 Million Standard cubic feet (MMScf) per day of sweet gas flows from the amine sweetening contactor to the existing propane refrigeration areas. The rich amine, which absorbed the acid gas components (H_2S and CO_2), flows to the flash separator from the bottom of the contactor. Any co-absorbed hydrocarbons flash off here and recycle to the first stage suction. The rich amine flows to a preheater before going on to the regenerator. The regenerator uses a direct-fired reboiler to heat the rich amine solution, thus driving off the absorbed acid gases. Acid gas leaving the regenerator overhead is burned continuously in the Challenger Flare.

Lean amine, now stripped of acid gas, flows back through the lean/rich exchanger. This provides preheat to the rich amine going to the regenerator. The lean amine is further cooled in an aerial cooler, then pumped back to the contactor.

The plant also serves as a fractionation plant. After being dehydrated and desulfurized, natural gas is brought into the plant and broken down into its components. The individual components are butane, propane, gasoline, and saleable natural gas.

The VOC product loading and receiving at the Bear Paw facility is operated under a vapor balance system. All VOC product loading to tank trucks is conducted using bottom loading. Vapor flash resulting from loadout operations is returned to the associated storage vessel to maintain vapor balanced emissions control. Upon completion of VOC product loadout, all lines used for loading are purged of VOC vapors. These VOC vapors are then routed to a flare for thermal destruction.

C. Permit History

In May 1992, Western Gas Resources (WGR) applied for a permit to operate their existing natural gas processing plant and associated equipment and to construct a Challenger Flare that would be used for emergency situations to increase safety.

On June 28, 1993, WGR's **Permit #2736-00** was final. The flare was constructed and placed in operation in October 1993. Also, as a requirement of the permit, WGR was required to install Non-Selective Catalytic Reduction (NSCR) units on the two compressor engines for control of NO_x, CO, and VOC emissions. The 800-hp White Superior Compressor Engine was permitted, as it existed at the time, with two exhaust stacks. In October 1993, the White Superior exhaust stacks were retrofitted into one stack; therefore, only one NSCR unit was required for that source. The NSCR units were then installed in November 1993, and the engines were tested in January 1994.

On February 8, 1995, **Permit #2736-01** became final. The permitting action reflected a modification to remove all references to the second stack on the 800-hp White Superior Compressor Engine, change the emission limits to reflect mass emission limits in pounds/hour rather than grams/hp-hr, and change the derated horsepower to the rated horsepower. WGR also requested the permit testing language be changed to reflect the updated Montana Source Test Protocol and Procedures Manual. Permit #2736-01 replaced Permit #2736-00.

On December 10, 1993, a lottery was held and WGR's Baker Gas Plant (Permit #2736-01) was selected to submit their Title V operating permit application in the first year. WGR requested that the facility be removed from the Title V permit list since Permit #2736-01 indicated the total criteria pollutants were less than 100 tons per year.

On August 25, 1996, **Permit #2736-02** became final. Before the Department of Environmental Quality (Department) made a final determination on whether a Title V permit was necessary for this facility, a complete emission inventory of HAPs emitted was developed and submitted to the Department for review. A complete emission inventory of fugitive VOCs was also required since a number of fugitive VOC sources were not identified during the initial permitting action. WGR submitted a permit alteration for all sources of VOCs and HAPs not previously identified in Permit #2736-01. This permit alteration was for the following VOC emission units:

- Fugitive VOC leaks from components in VOC service;
- 4.0 MMscfd ethylene glycol dehydration unit;
- Bottom loading, vapor balance, product loading facility; and,
- 3 fixed-roof condensate storage tanks.

Permit #2736-02 replaced Permit #2736-01.

On June 27, 1997, **Permit #2736-03** became final. The permitting action included: a change of ownership from WGR to Bear Paw; a proposed increase in production from 1.4 MMScf per day to 4.2 MMScf per day; and a proposal to add an amine sweetening unit and a new Guyed flare to control emissions from the proposed production increase. The proposed amine unit supplemented the previously permitted iron sponge. The alteration also increased SO_2 by 116 tons per year, which resulted from the production increase at the facility. Emissions are controlled by an amine sweetening unit and a new flare. The proposed increase in emissions was below New Source Review (NSR) threshold levels and did not trigger Prevention of Significant Deterioration (PSD). However, the Bear Paw facility became a Title V source because of the increase in emissions. Permit #2736-03 replaced Permit #2736-02.

The Department received a request from Bear Paw on September 22, 1997, to modify Permit #2736-03. Bear Paw was previously required to route the pressurized tanks to a flare. During the 1997 inspection conducted by the Department, it was discovered that the pressurized tanks were not routed to the flare as required by Permit #2736-03. However, upon further investigation, the Department determined that it does not make sense to have these pressurized tanks routed to the flare because they only vent in emergency situations. Furthermore, the routing could cause venting, that means a direct product loss to the company. Permit #2736-03 was modified by removing the routing language. There was no change in the potential emissions because the emissions inventory did not calculate the tank emissions as being controlled by the flare. On November 21, 1997, **Permit #2736-04** became final and replaced Permit #2736-03.

On September 23, 1998, the Department received a complete application requesting an alteration to Permit #2736-04. Bear Paw requested to add a single 1250-hp Waukesha Compressor Engine or a series of Waukesha Compressor Engines equivalent to 1250-hp. Because the emissions would be the same if there is one engine or a series of engines, the Department approved this alteration to allow Bear Paw operational flexibility. On November 8, 1998, **Permit #2736-05** became final and replaced Permit #2736-04.

On September 4, 2001, the Department received a permit application from Compliance Partners, Inc., on behalf of Bear Paw, requesting an alteration to Permit #2736-05. The application requested to increase the facility's throughput from 4.2 MMScf per day to 8.5 MMScf per day. The application was deemed complete upon submittal of additional information on October 12, 2001. The alteration increased SO_2 emissions from 117.1 tons/year to 235.3 tons/year. The proposed 118.2 tons/year emission increase was below

NSR threshold levels and did not trigger PSD. The alteration increased the facility's throughput from 4.2 MMScf per day to 8.5 MMScf per day. In addition, the permit format and permit language were updated. On December 13, 2001, **Permit #2736-06** became final and replaced Permit #2736-05.

D. Current Permit Action

On May 21, 2002, the Department received a letter from Bear Paw notifying the Department of a de minimis change at the Bear Paw facility. The de minimis change consists of switching the responsibilities of the two flares at the facility. The Department requested that Bear Paw submit a gas analysis for the facility because the calculations submitted for Department review used an H_2S concentration lower than the concentration in the emission inventory of Permit #2736-06. On July 14, 2002, Bear Paw submitted a gas analysis for the facility demonstrating that the concentration of H_2S in the gas stream is 600 parts per million (ppm). The current permit action does not increase emissions from the facility. In fact, the gas analysis submitted to the Department demonstrates that SO_2 emissions from the facility will decrease.

In addition, Bear Paw requested a condition be added to the permit regulating the amount of natural gas (supplemental fuel) to be added to the acid gas stream prior to flaring (950 cubic feet per hour (ft^3/hr) at maximum capacity). The condition will ensure that the impacts from the emissions from the shorter challenger flare will not violate either the National Ambient Air Quality Standards (NAAQS) or the Montana Ambient Air Quality Standards (MAAQS).

The current permit action switches the responsibilities of the two flares according to the provisions of ARM 17.8.705(1)(r). The guyed utility acid gas flare will now be used to destroy the gas stream created from process upsets (including emergency relief valves) and the challenger flare will now be used to destroy the acid gas stream from the amine regenerator. In addition, the current permit action modifies the permit according to the provisions of ARM 17.8.705(2) to add a condition requiring 20% of the total gas routed to the flare is natural gas. **Permit #2736-07** replaces Permit #2736-06.

E. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT) determinations, air quality impacts, and environmental assessments, is included in the analysis associated with each change to the permit.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available upon request from the Department. Upon request, the Department will provide references for the location of all applicable rules and regulations and provide copies where appropriate.

A. ARM 17.8, Subchapter 1 - General Provisions, including, but not limited to:

1. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

2. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source, or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq*., Montana Code Annotated (MCA).

Bear Paw shall comply with all requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

3. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.

4. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction in the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner that a public nuisance is created.

B. ARM 17.8, Subchapter 2 - Ambient Air Quality, including, but not limited to:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.206 Methods and Data
3. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
4. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
5. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
6. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate
7. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}

Bear Paw must comply with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 - Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. (2) This rule requires that no person may cause or authorize emissions to be discharged to an outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of 20% for all fugitive emissions sources and that reasonable precautions be taken to control emissions from airborne particulate matter. (2) Under this rule, Bear Paw shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.316 Incinerators. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any incinerator, particulate matter in excess of 0.10 grains per standard cubic feet of

dry flue gas, adjusted to 12% carbon dioxide and calculated as if no auxiliary fuel had been used. Also, no person shall cause or authorize to be discharged into the outdoor atmosphere, from any incinerator, emissions that exhibit an opacity of 10% or greater averaged over 6 consecutive minutes.

4. ARM 17.8.322 Sulfur Oxide Emissions - Sulfur in Fuel. (5) Commencing July 1, 1971, no person shall burn any gaseous fuel containing sulfur compounds in excess of 50 grains per 100 cubic feet of gaseous fuel, calculated as hydrogen sulfide at standard conditions. Bear Paw will consume pipeline quality natural gas in their fuel burning equipment, which will meet this limitation.

5. ARM 17.8.324 Hydrocarbon Emissions - Petroleum Products. This rule outlines the emission standards for hydrocarbon storage tanks, oil-effluent water separators, and gasoline loading operations and specific exemptions from this rule.

   The natural gasoline storage tanks are exempt from this rule since they are less than the 65,000-gal (1546 bbls) capacity limit. The natural gasoline storage tanks shall be filled through a permanently submerged fill pipe, unless the tank is equipped with a vapor loss control device or is a pressurized tank.

6. ARM 17.8.340 Standard of Performance for New Stationary Sources. The owner or operator of any stationary source or modification, as defined and applied in 40 CFR Part 60, shall comply with the provisions of 40 CFR Part 60.

   40 CFR 60, Subpart LLL, Standards of Performance for Onshore Natural Gas Processing: SO_2 Emissions is applicable to the amine unit. However, because Bear Paw has demonstrated that the design capacity of the facility is less than 2 long ton/day of hydrogen sulfide in the acid gas (expressed as sulfur), only 40 CFR 60.647(c) is applicable to the facility.

   40 CFR 60, Subpart XX, Standards of Performance for Bulk Gasoline Terminals does not apply to this facility. Subpart XX is not applicable to this facility because the facility throughput is 9,000 gal/day, which is less than the 20,000 gal/day required for applicability.

   40 CFR 60, Subpart KKK, Standards of Performance for Equipment Leaks of VOCs from Onshore Natural Gas Processing Plants is not applicable to this facility because the facility was constructed prior to January 20, 1984.

7. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. The owner or operator of any affected source, as defined and applied in 40 CFR Part 63, shall comply with the requirements of 40 CFR Part 63.

   40 CFR 63, Subpart HH National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities. Owners or operators of oil and natural gas production facilities, as defined and applied in 40 CFR Part 63, shall comply with the standards and provisions of 40 CFR Part 63, Subpart HH. In determining whether Bear Paw's facility was a 40 CFR Part 63, Subpart HH affected source, the Department compared the facility to larger facilities permitted in Montana. The Department made determinations that several of the larger facilities in Montana do not meet the definition of a major source of HAP as defined in 40 CFR Part 63, Subpart HH. Based upon the previous determinations and the size of Bear Paw's Facility, 40 CFR Part 63, Subpart HH would not apply to the Bear Paw facility because it would not be a major source of HAPs.

40 CFR 63, Subpart HHH National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities. Owners or operators of natural gas transmission or storage facilities, as defined and applied in 40 CFR Part 63, shall comply with the standards and provisions of 40 CFR Part 63, Subpart HHH. In determining whether Bear Paw's facility was a 40 CFR Part 63, Subpart HHH affected source, the Department compared the facility to larger facilities permitted in Montana. The Department made determinations that several of the larger facilities in Montana do not meet the definition of a major source of HAPs as defined in 40 CFR Part 63, Subpart HHH. Based upon the previous determinations and the size of Bear Paw's facility, 40 CFR Part 63, Subpart HHH would not apply to the Bear Paw facility because it would not be a major source of HAPs.

D. ARM 17.8, Subchapter 5 - Air Quality Permit Application, Operation and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. Bear Paw shall submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. The current permit action will not increase emissions or add or alter any emitting units and is considered an administrative action; therefore, Bear Paw was not required to submit an application or the corresponding application fee for the current permit action.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit, excluding an open burning permit, issued by the Department. This operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

   An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, as described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that pro-rate the required fee amount.

E. ARM 17.8, Subchapter 7 - Permit, Construction and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.701 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.704 General Procedures for Air Quality Preconstruction Permitting. An air quality preconstruction permit shall contain requirements and conditions applicable to both construction and subsequent use of the permitted equipment.

3. ARM 17.8.705 When Permit Required--Exclusions. This rule requires a facility to obtain an air quality permit if they construct, alter, or use an air contaminant source that has the potential to emit more than 25 tons per year of any pollutant. Bear Paw has the potential to emit more than 25 tons per year of NO_x, SO_x, VOC, and CO; therefore, a permit is required.

4. ARM 17.8.706 New or Altered Sources and Stacks, Permit Application Requirements. This rule requires that an application for an air quality permit be submitted for a new or altered source or stack. The current permit action will not increase emissions or add or alter any emitting units and is considered an administrative action; therefore, Bear Paw was not required to submit an application for the current permit action.

5. ARM 17.8.710 Conditions for Issuance of Permit. This rule requires that the source demonstrate compliance with applicable rules and standards before a permit can be issued. Also, a permit may be issued with such conditions as are necessary to assure compliance with all applicable rules and standards. Bear Paw demonstrated compliance with all applicable rules and standards as required for permit issuance.

6. ARM 17.8.715 Emission Control Requirements. Bear Paw is required to install on a new or altered source, the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is addressed in Section III of this permit analysis.

7. ARM 17.8.716 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

8. ARM 17.8.717 Compliance with Other Statutes and Rules. This rule states that nothing in the permit shall be construed as relieving Bear Paw of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.701, *et seq*.

9. ARM 17.8.720 Public Review of Permit Applications. This rule requires that Bear Paw notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. The current permit action will not increase emissions or add or alter any emitting units and is considered an administrative action; therefore, Bear Paw was not required to submit an affidavit of publication of public notice for the current permit action.

10. ARM 17.8.731 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter; except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

11. ARM 17.8.733 Modification of Permit. An air quality permit may be modified for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase in emissions because of those changed

conditions. A source may not increase its emissions beyond those found in its permit unless the source applies for and receives another permit.

12. ARM 17.8.734 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.

F. ARM 17.8, Subchapter 8 - Prevention of Significant Deterioration, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modification--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification with respect to each pollutant subject to regulation under the Federal Clean Air Act (FCAA) that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source because it is not listed and does not have the potential to emit (PTE) more than 250 tons per year (excluding fugitive emissions) of any air pollutant.

G. ARM 17.8, Subchapter 12 - Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) A Major Source under Section 7412 of the FCAA is defined as any stationary source having:

a. PTE greater than 100 tons/year of any pollutant;

b. PTE greater than 10 tons/year of any one HAP, or PTE greater than 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or

c. Sources with PTE greater than 70 tons/year of PM_{10} in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program Applicability. Title V of the FCAA Amendments of 1990 requires that all sources, as defined in ARM 17.8.1204 (1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #2736-07 for the Bear Paw facility, the following conclusions were made:

a. The facility's PTE is greater than 100 tons/year for SO_x;

b. The facility's PTE is less than 10 tons/year of any one HAP and less than 25 tons/year of all HAPs;

c. This source is not located in a serious PM_{10} nonattainment area;

d. The facility is not subject to any current NSPS;

e. This facility is not subject to any current NESHAP standards;

f. The source is not a Title IV affected source nor a solid waste combustion unit; and

g. The source is not an EPA designated Title V source.

Based on these facts, the Department determined that the Bear Paw facility is subject to Title V.

H. MCA 75-2-103, Definitions provided in part as follows:

1. "Incinerator" means any single or multiple chambered combustion device that burns combustible material, alone or with a supplemental fuel or catalytic combustion assistance, primarily for the purpose of removal, destruction, disposal, or volume reduction of all or any portion of the input material.

2. "Solid waste" means all putrescible and non putrescible solid, semisolid, liquid, or gaseous wastes including, but not limited to...air pollution control facilities...

I. MCA 75-2-215, Solid or hazardous waste incineration -- additional permit requirements, including, but not limited to, the following requirements:

The Department may not issue a permit to a facility until: (d) the Department has reached a determination that the projected emissions and ambient concentrations will constitute a negligible risk to the public health, safety, and welfare and to the environment.

A health risk analysis to estimate the risk from the burning of HAPs in the vapor combustion unit (VCU) was completed when Permit #2736-03 was issued. As explained is Section 5 of this permit analysis, the concentrations of HAPs are still less than the levels contained in ARM 17.8.706(5).

III. BACT Determination

A BACT determination is required for each new or altered source. Bear Paw shall install on the new or altered source the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The current permit action will not increase emissions or add or alter any emitting units; therefore, a BACT analysis is not required.

IV. Emission Inventory

	Ton/Year				
Source	PM_{10}	NO_x	VOC	CO	SO_x
1250-hp Waukesha +Catalytic Converter	0.46	24.14	12.07	24.14	0.02
448-hp Waukesha F3521G	0.10	8.63	4.32	12.95	0.01
800-hp White Superior 8G-825	0.19	15.42	7.71	23.13	0.02
Anderson Baird Heater	0.24	1.98	0.12	0.42	0.01
Fugitive VOC Emissions	0.00	0.00	9.51	0.00	0.00
Dehydration Unit	0.00	0.00	0.43	0.00	0.00
Product Loading	0.00	0.00	9.45	0.00	0.00
Storage Tanks	0.00	0.00	7.26	0.00	0.00
Amine Regenerator Burner	0.03	1.23	0.03	0.31	1.32
Guyed Utility Flare (#2) Pilot	0.00	0.02	0.00	0.00	0.02
Challenger Flare (#1) Pilot	0.01	0.04	0.00	0.01	0.04
Challenger Flare (#1)	0.00	0.00	0.00	0.00	78.33
Guyed Utility Flare #2	0.00	0.00	0.00	0.00	78.33

Total Emissions	1.03	51.46	50.90	60.96	158.10

1250-hp Waukesha with Johnson Mathey Catalytic Converter

Brake Horsepower: 1250 hp
Hours of operation: 8760 hr/yr
Heat Content: 1050 Btu/Scf
Fuel Combustion: 250,000 Scf/day
Fuel Consumption Rate: 1050 Btu/scf *250,000 scf/day*(1 day/24 hr)* 1/1250 hp = 8,750 Btu/hp-hr

PM_{10} Emissions:
Emission Factor: 10 lbs/MMScf gas {2-02-002-02, AFSEF page 32}
Calculations: 0.25MMScf/day * 10 lb/MMScf * 0.0005 ton/lb * 365 day/yr = 0.46 ton/yr

NO_x Emissions:
Emission factor: 2.00 gram/hp-hr {Based on BACT Analysis}
Calculations: 2.00 gram/hp-hr * 1250 hp * 0.002205 lb/gram = 5.51 lb/hr
5.51 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 24.14 ton/yr

VOC Emissions:
Emission factor: 1.00 gram/hp-hr {Based on BACT Analysis}
Calculations: 1.00 gram/hp-hr * 1250 hp * 0.002205 lb/gram = 2.76 lb/hr
2.76 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 12.07 ton/yr

CO Emissions:
Emission factor: 2.00 gram/bhp-hr {Based on BACT Analysis}
Calculations: 2.00 gram/hp-hr * 1250 hp * 0.002205 lb/gram = 5.51 lb/hr
5.51 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 24.14 ton/yr

SO_x Emissions:
Emission factor: 0.002 gram/hp-hr {AP-42, Table 3.2-1, 9/85}
Calculations: 0.002 gram/hp-hr * 1250 hp * 0.002205 lb/gram = 0.006 lb/hr
0.006 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.024 ton/yr

448-hp Waukesha F3521G

Brake Horsepower: 448 hp @ 1000 rpm
Hours of operation: 8760 hr/yr

PM_{10} Emissions:
Emission Factor: 10lb/MMScf gas {2-02-002-02, AFSEF page 32}
Fuel Consumption: 7250 Btu/hp-hr {Maximum Design}
Calculations: 7250 Btu/hp-hr * 0.000695 Scf/Btu * 448 hp * 8760 hr/yr = 19.77 MMScf/yr
20 MMScf/yr * 10 lb/MMScf gas * 0.0005 ton/lb = 0.10 ton/yr

NO_x Emissions:
Emission factor: 2.00 gram/hp-hr {Based on BACT Analysis}
Calculations: 2.00 gram/hp-hr * 448 bhp * 0.002205 lb/gram = 1.98 lb/hr
1.98 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 8.63 ton/yr

VOC Emissions:
Emission factor: 1.00 gram/hp-hr {Based on BACT Analysis}
Calculations: 1.00 gram/bhp-hr * 448 bhp * 0.002205 lb/gram = 0.99 lb/hr
0.99 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 4.32 ton/yr

CO Emissions:
Emission factor: 3.00gram/hp-hr {Based on BACT Analysis}
Calculations: 3.00 gram/bhp-hr * 448 bhp * 0.002205 lb/gram = 2.96 lb/hr

2.96 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 12.95 ton/yr

SO_x Emissions:
Emission factor: 0.002 gram/hp-hr {AP-42, Table 3.2-1, 9/85}
Calculations: 0.002 gram/hp-hr * 448 bhp * 0.002205 lb/gram = 0.002 lb/hr
0.002 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.01 ton/yr

800-hp White Superior 8G-825

Brake Horsepower: 800 hp @ 900 rpm
Hours of operation: 8760 hr/yr

PM_{10} Emissions:
Emission Factor: 10 lb/MMScf gas {2-02-002-02, AFSEF page 32}
Fuel Consumption: 7750 Btu/hp-hr {Maximum Design}
Calculations: 7750 Btu/hp-hr * 0.000695 Scf/Btu * 800 hp * 8760 hr/yr = 37.75 MMScf/yr
38 MMScf/yr * 10 lb/MMScf gas * 0.0005 ton/lb = 0.19 ton/yr

NO_x Emissions:
Emission factor: 2.00 gram/hp-hr {Based on BACT Analysis}
Calculations: 2.00 gram/hp-hr * 800 hp * 0.002205 lb/gram = 3.53 lb/hr
3.53 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 15.42 ton/yr

VOC Emissions:
Emission factor: 1.00 gram/hp-hr {Based on BACT Analysis}
Calculations: 1.00 gram/hp-hr * 800 hp * 0.002205 lb/gram = 1.76 lb/hr
1.76 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 7.71 ton/yr

CO Emissions:
Emission factor: 3.00 gram/bhp-hr {Based on BACT Analysis}
Calculations: 3.00 gram/hp-hr * 800 hp * 0.002205 lb/gram = 5.29 lb/hr
5.29 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 23.13 ton/yr

SO_x Emissions:
Emission factor: 0.002 gram/hp-hr {AP-42, Table 3.2-1, 9/85}
Calculations: 0.002 gram/hp-hr * 800 hp * 0.002205 lb/gram = 0.004 lb/hr
0.004 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.02 ton/yr

Anderson Baird Heater

Fuel Consumption: 6.50 MMBtu/hr
6.50 MMBtu/hr * 0.000695 Scf/Btu * 8760 hr/yr = 39.5733 MMScf/yr

PM_{10} Emissions:
Emission Factor: 12 lb/MMScf gas {AP-42, 1.4-1, 7/93}
Fuel Consumption: 39.5733 MMScf/yr {Information from company}
Calculations: 39.57 MMScf/yr * 12 lb/MMScf gas * 0.0005 ton/lb = 0.24 ton/yr

NO_x Emissions:
Emission Factor: 100 lb/MMScf gas {AP-42, 1.4-2, 7/93}
Fuel Consumption: 39.5733 MMScf/yr {Information from company}
Calculations: 39.57 MMScf/yr * 100 lb/MMScf gas * 0.0005 ton/lb = 1.98 ton/yr

VOC Emissions:
Emission Factor: 5.80 lb/MMScf gas {AP-42, 1.4-3, 7/93}
Fuel Consumption: 39.5733 MMScf/yr {Information from company}

Calculations: 39.57 MMScf/yr * 5.80 lb/MMScf gas * 0.0005 ton/lb = 0.11 ton/yr

CO Emissions:

Emission Factor: 21 lb/MMScf gas {AP-42, 1.4-2, 7/93}
Fuel Consumption: 39.5733 MMScf {Information from company}
Calculations: 39.57 MMScf/yr * 21 lb/MMScf gas * 0.0005 ton/lb = 0.42 ton/yr

SO_x Emissions:

Emission Factor: 0.60 lb/MMScf gas {AP-42, 1.4-2, 7/93}
Fuel Consumption: 39.5733 MMScf/yr {Information from company}
Calculations: 39.57 MMScf/yr * 0.60 lb/MMScf gas * 0.0005 ton/lb = 0.01 ton/yr

Fugitive VOC Emissions

Source	Number of Sources	Factor (lb/hr/source)	VOC Fraction	Emissions (lb/hr)	Emissions (ton/yr)
Valves - Gas	120	0.00992	0.07898	0.0940	0.41180
Valves - Prod. Gas	162	0.00992	0.48746	0.7834	3.43115
Valves - Light Liquid	316	0.00550	0.40000	0.6952	3.04498
Connector - Gas	5	0.00044	0.07898	0.0002	0.00076
Connector - Prod. Gas	19	0.00044	0.48746	0.0041	0.01785
Connector - Liquid	17	0.000463	0.47000	0.0037	0.01620
Flanges - Gas	125	0.00086	0.07898	0.0085	0.03719
Flanges - Prod. Gas	776	0.00086	0.48746	0.3253	1.42486
Flanges - Liquid	238	0.000243	0.40000	0.0231	0.10133
Open-End Lines - Gas	10	0.00441	0.07898	0.0035	0.01526
Open-End Lines - Prod. Gas	34	0.00441	0.48746	0.0731	0.32013
Open-End Lines - Liquid	17	0.00309	0.40000	0.0210	0.09203
Pump Seals - Prod. Liquid	3	0.02866	0.48746	0.0419	0.18357
Pump Seals - Light Liquid	5	0.02866	0.40000	0.0573	0.25106
Other	4	0.01940	0.48746	0.0378	0.16568
Total Fugitive Emissions				2.1721	9.5139

Dehydration Unit

The following emission summary has been estimated using the GRI-GLYCalc program.
For the detailed input parameters refer to the permit application.

Regenerator Vent

Glycol Type: Ethylene Glycol (EG)
Annual Hours of Operation: 8760
Dry Gas Flow Rate: 8.5 MMScf/day (actual-not increased due to increase through amine unit and flares)
Control Device: 6.5 MMBtu/hr Hot Oil Heater
Control Efficiency: 95%

Controlled Emissions	lb/hr	ton/yr
Total VOC Emissions	0.0899	0.3936
Total HAP Emissions	0.0052	0.0227

Uncontrolled Regenerator Emissions	lb/hr	ton/yr
Total VOC Emissions	1.7974	7.8725
Total HAP Emissions	0.1036	0.4536

Flash Separator

Closed System - Off gases are routed to the inlet condensate knock out drum.

Controlled Flash Separator Offgas	lb/hr	ton/yr
Total VOC Emissions	0	0
Total HAP Emissions	0	0

Uncontrolled Flash Separator Offgas	lb/hr	ton/yr
Total VOC Emissions	9.2172	40.3715
Total HAP Emissions	0.0031	0.0135

Product Loading

Ll = 12.46 (S*P*M/T)(1-eff/100)
Ll = Loading Loss Factor (lb/1000 gal)
S = Saturation Factor AP-42 (Table 4.4-1) = 1.00
Submerged Loading: dedicated vapor balance system
P = True Vapor Pressure of Liquid (psia)
M = Molecular Weight of the Vapor (lb/lb-mole)
T = Ambient Temperature (from average annual meteorological data) (deg R)
eff = Control Efficiency = 99%

Vessel Id.	Vessel Content	MW (lb/lb-mol) (M)	TVP (psia) (P)	Temp (deg R) (T)	Saturation Factor (S)	Emission Factor (Ll) (lb/1000 gal)
Re-run Tank #1	Y-Grade	53.00	195.20	509	1.00	253.25
Re-run Tank #2	Y-Grade	53.00	195.20	509	1.00	253.25
Propane Tank #1	Propane	44.11	90.00	509	1.00	97.18
Propane Tank #2	Propane	44.11	90.00	509	1.00	97.18
Butane Tank #1	Butane	58.13	23.00	509	1.00	32.73
Butane Tank #2	Butane	58.13	23.00	509	1.00	32.73
Gasoline Tank #1	Natural Gasoline	66.00	5.20	509	1.00	8.40

Vessel Id.	Emission Factor (Ll) (lb/1000 gal)	Annual Loadout (1000 gal/yr)	Vapor Rec. (% eff)	Uncont. Emissions (ton/yr)	Cont. Emissions (ton/yr)
Re-run Tank #1	253.25	2714	99.00	343.67	3.44
Re-run Tank #2	253.25	2714	99.00	343.67	3.44
Propane Tank #1	97.18	2138	99.00	103.89	1.04
Propane Tank #2	97.18	2138	99.00	103.89	1.04
Butane Tank #1	32.73	1207	99.00	19.75	0.20
Butane Tank #2	32.73	1207	99.00	19.75	0.20
Gasoline Tank #1	8.40	2413	99.00	10.14	0.10
Total				944.74	9.45

Storage Tanks

Vessel Id.	Vessel Content	Size (gal)	Annual Thru-put (1000 gal/yr)	Tank Emissions Standing (lb/yr)	Withdrawal (lb/yr)	Total (lb/yr)	Total (ton/yr)
Tank #807	Condensate	11,340	2413	650	422	1072	0.536
Tank #808	Condensate	16,800	2714	1040	5681	6721	3.3605
Tank #809	Condensate	16,800	2714	1040	5681	6721	3.3605

Total				14514	7.26

Amine Regenerator Burner

Maximum Capacity: 2 MMBtu/hr
Fuel Consumption: 2 MMBtu * MMBtu/0.0010 MMScf = 0.002 MMScf/hr
Hours of operation: 8760 hr/yr

PM_{10} Emissions:
Emission Factor: 3.00 lb/MMScf
Calculations: 3.00 lb/MMScf * 0.002 * MMScf/hr = 0.006 lb/hr
0.006 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.026 ton/yr

NO_x Emissions:
Emission Factor: 140.00 lb/MMScf
Calculations: 140.00 * lb/MMScf * 0.002 MMScf/hr = 0.28 lb/hr
0.280 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 1.226 ton/yr

CO Emissions:
Emission Factor: 35.00 lb/MMScf
Calculations: 35.00 * lb/MMScf * 0.002 MMScf/hr = 0.07 lb/hr
0.070 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.307 ton/yr

VOC Emissions
Emission Factor: 2.80 lb/MMScf
Calculations: 2.80 * lb/MMScf * 0.002 MMScf/hr = 0.0056 lb/hr
0.006 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.025 ton/yr

SO_x Emissions:
Fuel Type: 898.00 ppm H_2S
898 ppm H_2S *(1 grain/100 Scf *16 ppm)/(7000 grain/1 lb) =0.0080 lb H_2S
(0.0080 lb H_2S/100 Scf) * (64.06 lb SO_2/34.08 lb H_2S)= 150.71 lb SO_2/MMScf
Emission Factor: 150.71125 lb SO_2/MMScf
Fuel Consumption: 150.71 lb SO_2/MMScf * 0.002 MMScf/hr = 0.301 lb/hr
0.301 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 1.32 ton/yr

Guyed Utility Flare (#2) Pilot

Fuel Type: 600 ppm H_2S in the fuel
Fuel Consumption: 0.000044 MMScf/hr

PM_{10} Emissions:
Emission Factor: 12.0 lb/MMScf {AP-42, 1.4-1, 7/93}
Calculations: 12.0 lb/MMScf * 0.000044 MMScf/hr * 8760 hr/yr * 0.0005 ton/lb =0.002 ton/yr

NO_x Emissions:
Emission Factor: 100 lb/MMScf {AP-42, 1.4-1, 7/93}
Calculations: 100.0 lb/MMScf * 0.000044 MMScf/hr * 8760 hr/yr * 0.0005 ton/lb=0.019 ton/yr

VOC Emissions:
Emission Factor: 5.80 lb/MMScf {AP-42, 1.4-1, 7/93}
Calculations: 5.8 lb/MMScf * 0.000044 MMScf/hr * 8760 hr/yr * 0.0005 ton/lb =0.001 ton/yr

CO Emissions:
Emission Factor: 20.0 lb/MMScf {AP-42, 1.4-1, 7/93}

Calculations: 20.0 lb/MMScf * 0.000044 MMScf/hr * 8760 hr/yr * 0.0005 ton/lb =0.004 ton/yr

SO_x Emissions:

Fuel Type: 600.00 ppm H_2S

600 ppm H_2S*(1 grain/100 Scf *16 ppm)/(1 lb/7000 grain) = 0.0054 lb H_2S/100 Scf

(0.0054 lb H_2S/100 Scf) * (64.06 lb SO_2/34.08 lb H_2S)= 101.50 lb SO_2/MMScf

Emission Factor: 101.50 lb SO_2/MMScf

Calculations: 101.5lb SO_2/MMScf*0.000044 MMScf/hr*8760 hr/yr*0.0005 ton/lb=0.020 ton/yr

Challenger Flare (#1) Pilot

Fuel Type: 600 ppm H_2S in the fuel
Fuel Heat Content: 1439 Btu/scf
Production: 0.000088 MMScf/hr

PM_{10} Emissions:

Emission Factor: 12.0 lb/MMScf {AP-42, 1.4-1, 7/93}

Calculations: 12.0 lb/MMScf * 0.000088 MMScf/hr * 8760 hr/yr * 0.0005 ton/lb = 0.005 ton/yr

NO_x Emissions:

Emission Factor: 100lb/MMScf {AP-42, 1.4-1, 7/93}

Calculations: 100.0 lb/MMScf * 0.000088 MMScf/hr * 8760 hr/yr * 0.0005 ton/lb=0.039 ton/yr

VOC Emissions:

Emission Factor: 5.80 lb/MMScf {AP-42, 1.4-1, 7/93}

Calculations: 5.8 lb/MMScf * 0.000088 MMScf/hr * 8760 hr/yr * 0.0005 ton/lb = 0.002 ton/yr

CO Emissions:

Emission Factor: 20.0 lb/MMScf {AP-42, 1.4-1, 7/93}

Calculations: 20.0 lb/MMScf * 0.000088 MMScf/hr * 8760 hr/yr * 0.0005 ton/lb = 0.008 ton/yr

SO_x Emissions:

Fuel Type: 600.00 ppm H2S

600 ppm H_2S *(1 grain/100 Scf *16 ppm)/(1 lb/7000 grain) = 0.0054 lb H_2S/100 Scf

(0.0054 lb H_2S/100 Scf) * (64.06 lb SO_2/34.08 lb H_2S) = 101.50 lbSO_2/MMScf

Emission Factor: 101.50 lb SO_2/MMScf

Calculations: 101.5 lb SO_2/MMScf *0.000088 MMScf/hr*8760 hr/yr*0.0005 ton/lb=0.039 ton/yr

Flares

Fuel Consumption Total: 8.5 MMScf/day or 0.3542 MMScf/hr

Assume 50% split in flow for emission calculations or 0.1771 MMScf/hr/flare.

Challenger Flare #1

SO_x Emissions:

Fuel Consumption: 0.1771 MMScf/hr

Fuel Type: 600.00 ppm H_2S

600 ppm H_2S * (1 grain/100 Scf *16 ppm)*(1 lb/7000 grain) = 0.0054 lb H_2S/100 Scf

(0.0054 lb H_2S)/100 Scf)*(64.06 lbSO_2/34.08 lb H_2S) = 101.50 lbSO_2/MMScf

Emission Factor: 101.50 lb SO_2/MMScf

Calculation: 101.5 lb SO_2/MMScf *0.1771 MMScf/hr *8760 hr/yr *0.0005 ton/lb = 78.73 ton/yr

Guyed Utility Flare #2

SO_x Emissions
Continuous from Regenerator
Fuel Consumption: 0.1771 MMScf/hr
Fuel Type: 600.00 ppm H_2S
600 ppm H_2S *(1 grain/100 Scf *16 ppm)*(1 lb/7000 grain) = 0.0054 lb H_2S/100 Scf
(0.0080 lbs H_2S)/100 Scf)*(64.06 lb SO_2/34.08 lb H_2S) = 101.50 lb SO_2/MMScf

Emission Factor: 101.50 lb SO_2/MMScf
Calculation: 101.5 lb SO_2/MMScf *0.1771 MMScf/hr *8760 hr/yr *0.0005 ton/lb = 78.73 ton/yr

V. Air Quality Impacts

The Department ran SCREEN3, an EPA-approved screening model, using information from the permit application and an emission rate of 4.52970 grams per second which is the 157.47 tons per year of SO_2 emissions from the flare converted to grams per second. The Department also ran SCREEN3 using an emission rate of 0.3288 grams per second which is the 1.44 tons per year of SO_2 emissions from the remaining 7 SO_2 emitting units. Because the flare is located approximately 100 meters from the general plant operations, the maximum 1-hour concentration from the flare model was separately added to the 330 meter concentration and the 130 meter concentration from the remaining SO_2 emitting units model. In both cases, the sum of the concentrations was converted to parts per million (ppm) and compared to the ambient air quality standards to determine if the increased impacts from routing the acid gas to the shorter flare would cause the SO_2 emissions from the facility to violate ambient air quality standards.

SCREEN3 Model Run #1 - SO_2 - Flare(s)

Simple Terrain Inputs:

Source Type	=	Flare
Emission Rate (G/S)	=	4.52970
Flare Stack Height (M)	=	10.668 (approximately)
Total Heat Release Rate (Cal/s)	=	80498.
Receptor Height (M)	=	0.00
Urban/Rural Option	=	Rural
Building Height (M)	=	0.0000
Minimum Horizontal Building Dimension (M)	=	0.0000
Maximum Horizontal Building Dimension (M)	=	0.0000

SCREEN3 Model Run #2 - SO_2 - remaining SO_2 emitting units
(compressor engines, heater, amine unit, and piolets)

Simple Terrain Inputs:

Source Type	=	Point
Emission Rate (G/S)	=	0.3288
Stack Height (M)	=	10.00 (approximately)
Stack Inside Diameter (M)	=	0.42 (averaged)
Stack Exit Velocity (M/S)	=	33.87 (averaged)
Stack Gas Exit Temperature (K)	=	830.23 (averaged)
Ambient Air Temperature (K)	=	293.00 (default)
Receptor Height (M)	=	0.00
Urban/Rural Option	=	Rural

Building Height (M)	=	0.0000
Minimum Horizontal Building Dimension (M)	=	0.0000
Maximum Horizontal Building Dimension (M)	=	0.0000

The flare model calculated a maximum 1-hour concentration of 509.6 micrograms per cubic meter. The remaining SO_2 emitting units model calculated a maximum 1-hour concentration of 9.978 micrograms per cubic meter. Adding the maximum 1-hour concentration from the flare model to the maximum 1-hour concentration from the remaining SO_2 emitting units model results in a maximum 1-hour concentration of 519.6 micrograms per cubic meter. The combined maximum impacts from the models demonstrate that routing the acid gas to the shorter flare will not cause or contribute to a violation of the ambient air quality standards. In addition, given the predominant wind patterns in the area, the emissions from the flare would most likely not impact the same receptors as the other SO_2 emitting units.

A health risk analysis to estimate the risk from the burning of HAPs in the flare was completed for Permit #2736-03. The risk analysis contained the HAPs from the 1990 Federal Clean Air Act Amendments with an established risk value. The ambient concentrations were determined using SCREEN3. The SCREEN3 model determined that a health risk assessment was not necessary because the HAP concentrations were less than the levels contained in ARM 17.8.706(5). Because Bear Paw submitted a gas analysis for the facility demonstrating that the concentration of H_2S in the gas stream is 600 ppm rather than the 898 ppm previously used in the emission inventory, the SO_2 emissions from the flare(s) are decreased from the previous version of the permit (#2736-06). However, the SO_2 emissions from the flare(s) increased by a factor of 1.4 from the health risk analysis completed by the Department for Permit #2736-03. Therefore, the Department made a conservative determination based on the linear relationship between the SO_2 emission increase and the modeled levels. The Department determined that because the SO_2 emissions increased by a factor of 1.4, the modeled levels would increase by a factor of 1.4. The modeled HAP concentrations from Permit #2736-03 were multiplied by 1.4 and the Department determined that a health risk assessment was not necessary for the current permit action because the HAP concentrations in Table I are still less than the levels contained in ARM 17.8.706(5) and would still present only negligible risk to the public health safety, and welfare and to the environment.

Table I. Health Risk Analysis HAP Concentrations

Pollutant	Modeled Level	Cancer Deminimis Level	Non-Cancer Deminimis Level (chronic)	(acute)
Hexane	$5.00*10^{-4}$	-	$2.00*10^{+0}$	-
Benzene	$7.10*10^{-4}$	$1.2048*10^{-2}$	$7.10*10^{-1}$	-
Toluene	$8.10*10^{-3}$	-	$4.00*10^{+0}$	-
Ethyl Benzene	$7.00*10^{-4}$	-	$1.00*10^{+1}$	-
Xylene	$7.00*10^{-4}$	-	$3.00*10^{+0}$	-

VI. Taking or Damaging Implication Analysis

As required by 2-10-101 through 105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

VII. Environmental Assessment

This permitting action will not result in an increase of emissions from the facility and is considered an administrative action; therefore, an Environmental Assessment is not required.

Analysis Prepared By: Dave Aguirre
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